C7

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/883,324	06/19/2001	Takenobu Kitahara	N01287US	2282

466 7590 03/03/2003

YOUNG & THOMPSON
745 SOUTH 23RD STREET 2ND FLOOR
ARLINGTON, VA 22202

EXAMINER	
DONG, DALEI	

ART UNIT	PAPER NUMBER
2875	

DATE MAILED: 03/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/883,324	KITAHARA, TAKENOBU
	Examiner	Art Unit
	Dalei Dong	2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *09/883,324* .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,771,328 to Wortman.

Regarding to claim 1, Wortman discloses in Figures 3-6, a "representative cross-section of a portion of one embodiment of a light directing film in accordance with the present invention. The film 30 includes a first surface 32 and an opposing structured surface 34 which includes a plurality of substantially linearly extending <u>prism</u> elements 36. Each <u>prism</u> element 36 has a first side surface 38 and a second side surface 38', the top edges of which intersect to define the peak, or apex 42 of the <u>prism</u> element 36. The bottom edges of side surfaces 38, 38' of adjacent <u>prism</u> elements 36 intersect to form a linearly extending groove 44 between <u>prism</u> elements. In the embodiment illustrated in FIG. 3, the dihedral angle defined by the <u>prism</u> apex 42 measures approximately 90 degrees, however it will be appreciated that the exact measure of the dihedral angle in this and other embodiments may be varied in accordance with desired optical parameters. It is known in the art to use <u>prism</u> elements having dihedral angles which measure

between 70.degree. degrees and 110.degree" (column 3, lines 59-67 to column 4, lines 1-9).

Wortman also discloses in Figures 3-6, "the structured surface 34 of film 30 may be described as having a plurality of alternating zones of prism elements having peaks which are spaced at different distances from a common reference plane. The common reference plane may be arbitrarily selected. One convenient example of a common reference plane is the plane which contains first surface 32; another is the plane defined by the bottom of the lower most grooves of the structured surface, indicated by dashed line 39. In the embodiment illustrated in FIG. 3, the shorter prism elements measure approximately 50 microns in width and approximately 25 microns in height, measured from dashed line 39, while the taller prism elements measure approximately 50 microns in width and approximately 26 microns in height. Importantly, the width of the zone which includes the taller prism elements preferably measures between about 1 micron and 300 microns. By contrast, the width of the zone which includes the shorter prism elements is not critical and, in the disclosed embodiment, measures between 200 microns and 4000 microns. It is preferable, however, that in any given embodiment the zone of shorter prism elements be at least as wide as the zone of taller prism elements. It will be appreciated by one of ordinary skill in the art that the article depicted in FIG. 3 is merely exemplary and is not intended to limit the scope of the present invention. For example, the height or width of the prism elements may be changed within practicable limits--it is practicable to machine precise prisms in ranges extending from about 1 micron to about

175 microns. Additionally, the dihedral angles may be changed or the prism axis may be tilted to achieve a desired optical effect" (column 4, lines 10-39).

Wortman further discloses in Figures 3-6, "in use, when a second sheet of light directing film is placed adjacent structured surface 34, its physical proximity to sheet 30 is limited by the peaks of the taller prism elements. It has been determined that introducing a variation of as little as about 0.5 microns between the height of taller and shorter prism elements significantly inhibits the occurrence of undesired optical coupling in the zone of shorter prism elements. Thus, utilizing a variable height structured surface 34 to physically control the proximity of an adjacent surface dramatically reduces the surface area of structured surface 34 which is susceptible to undesired optical coupling. Instead, optical coupling occurs only within the zones which include the taller prism elements" (column 4, line 40-52).

Wortman further yet discloses in Figure 7, "a display 100 incorporating a light directing article in accordance with the principles of the present invention. Display 100 includes a case 112, a light source 116, a first sheet of light directing film 118, a second sheet of light directing film 118', a light gating device 126, and a substantially transparent cover sheet 128. In the embodiment disclosed in FIG. 7 the light source 116 is an electroluminescent panel, however it will be appreciated that other light sources, such as, for example a fluorescent backlighting assembly commonly used with laptop computers or a passive reflective display commonly used in some calculators, are within the scope of the present invention. Additionally, while the light gating device 126 disclosed in

FIG. 7 is preferably a liquid crystal device, other light gating devices are within the scope of the present invention" (column 5, lines 58-67 to column 6, lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the light directing film of Wortman for the display of Wortman in order to reduce undesirable optical coupling between adjacent sheets of light directing film without sacrificing the optical performance of the article and control the undesirable optical coupling between its structured surface and an adjacent surface.

3. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,771,328 to Wortman in view of U.S. Patent No. 5,855,994 to Biebuyck in further view of U.S. Patent No. 4,963,788 to King.

Regarding to claims 2 and 3, Wortman discloses an image display apparatus, however, Wortman does not disclose the image display apparatus is an organic electroluminescence display with antireflection film.

Biebuyck teaches in Figure 1, "a discrete organic light emitting device 10 is shown. It comprises an electrode 12 (cathode) situated on a substrate 11. On top of the electrode 12 a stack of three organic layers 13-15 is situated. The organic layer 13 serves as electron transport layer (ETL) and the organic layer 15 serves as hole transport layer (HTL). The organic layer 14 which is embedded between the two transport layers 13 and 15 serves as electroluminescent layer (EL). In the following, the stack of organic layers will be referred to as organic region, for sake of simplicity. In the present embodiment, the organic region carries the reference number 19. On top of the HTL 15, a top

electrode (anode) 16 is formed. The upper most surface of the device 10 is sealed by a Siloxane film 17. This film 17 conforms to the device 10. In the present example, the optical element may also be used to cover and protect cathode-up structures" (column 4, line 64-67 to column 5, line 1-13).

Biebuyck also teaches "conventional AgMg and ITO contacts still have a significant barrier to carrier injection in preferred ETL and HTL material, respectively. Therefore, a high electric field is needed to produce significant injection current" (column 2, line 23-27). Biebuyck further discloses "example of optical elements that may be formed in, or embedded by the encapsulant are: lenses, filters, color converts, gratings, diffusers, polarizers, and prisms just to mention some example. A mixture of color converts and attenuators may be brought into contact with, or formed on top of an organic multi-color light emitting array, in order to compensate for unequal efficiency of the light generation at different wavelength" (column 7, line 18-25).

However, Biebuyck does not disclose a polarizing filter and a antireflection layer on top of the glass substrate. King teaches, "to minimize the reflection of ambient light, an antireflection coating is typically used on the front glass. Also dark backgrounds behind the display are commonly provided. The TFEL laminar stack is situated within an enclosure sealed against the substrate, and the rear wall of this closure is usually blackened to block light from extraneous light sources behind the display, and to absorb ambient light passing through the display from the front. Another method of improving the contrast and attenuating the amount of light reflected from the rear aluminum

electrodes is to use an external circularly polarized contrast enhancement filter in front of the display" (column 1, line 28-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the light directing film of Wortman for the organic electroluminescence display of Biebuyck along with the polarizing and antireflection filter of King in order to reduce undesirable optical coupling between adjacent sheets of light directing film without sacrificing the optical performance of the article and control the undesirable optical coupling between its structured surface and an adjacent surface; and furthermore, to improve contrast and minimize the reflection of ambient light.

4. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,771,328 to Wortman in view of U.S. Patent No. 5,999,153 to Lind in further view of U.S. Patent No. 4,963,788 to King.

Regarding to claims, Wortman discloses an image display apparatus, however, Wortman does not disclose the image display apparatus is liquid crystal display with circular filter and antireflection film.

Lind teaches in Figures 3 and 4, "a nematic liquid crystal layer 26 is located between alignment layers 29 and addressing electrodes 25 and 27 on opposite sides. The color filter stack 22 and planarizing layer 24 are constructed in accordance with U.S. Pat. No. 5,463,484, wherein the colorants can be those described above in accordance with the present invention. Two glass panels 21 and 28 enclose the assembly described and

linear <u>polarizing filters</u> 30, arranged in mutually perpendicular orientations are attached to the two outside faces of the assembly" (column 4, lines 57-65).

Lind also teaches in Figures 3 and 4, "a planar white light source 31, which may comprise the illuminating means 16 and which uniformly illuminates the entire display area, completes the display system. It will be understood that FIG. 4 illustrates one possible passive or active matrix display assembly according to the present invention and that other means of illuminating the colored elements with electronically modulated white light are equally within the purview of the present invention. For example, a cathode ray tube (CRT), preferably of the black and white type, may be provided behind the color filter stack 22 and the brightness of various regions of the CRT may be controlled to reproduce the image. Alternatively a particle layer or film layer may be suspended behind the color filter stack 22 and may be backlit. The particle or film layer may include regions of differing light transparency to reproduce the image. Any other means of producing white light intensities with a substantially flat spectral characteristic curve and having regions ranging from dark to bright in regions corresponding to and aligned with the colored display elements may alternatively be used. The intensity levels of the white light source may further be selected to limit the gamut of displayed colors" (column 4, lines 66-67 to column 5, lines 5-20).

However, Lind fails to teach a circular filter and an antireflection film. King teaches "to minimize the reflection of ambient light, an antireflection coating is typically used on the front glass. Also dark backgrounds behind the display are commonly provided. The TFEL laminar stack is situated within an enclosure sealed against the

substrate, and the rear wall of this closure is usually blackened to block light from extraneous light sources behind the display, and to absorb ambient light passing through the display from the front. Another method of improving the contrast and attenuating the amount of light reflected from the rear aluminum electrodes is to use an external circularly polarized contrast enhancement filter in front of the display" (column 1, line 28-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the light directing film of Wortman for the liquid crystal display of Lind along with the polarizing and antireflection filter of King in order to reduce undesirable optical coupling between adjacent sheets of light directing film without sacrificing the optical performance of the article and control the undesirable optical coupling between its structured surface and an adjacent surface; and furthermore, to improve contrast and minimize the reflection of ambient light.

5. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,019,654 to Kim in view of U.S. Patent No. 5,771,328 to Wortman in further view of U.S. Patent No. 4,963,788 to King.

Regarding to claims 7-10, Kim discloses in Figure 2, "the multi-color ELD array panel includes a plurality of fluorescent media 12 of red, green and blue colors formed on a transparent support 11, an array of partition walls 13 made of a conductive material between the fluorescent media 12, and first electrode stripes 14 connected to the partition

walls 13 and formed over the fluorescent media 12, together with an electroluminescent layer 15, second electrode stripes 16 and a protective layer 17" (column 3, lines 30-37)

Kim also discloses in Figure 2, "a fluorescent medium layer 12 is formed on a transparent support 11 to a thickness of approx. 10 nm.about.2000 nm using a physical vapor deposition method such as thermal evaporation, e-beam deposition, sputter deposition and ionized cluster beam deposition, a chemical vapor deposition technique, or a wet process such as spin coating, dipping, Doctor blade method and the like. A series of film forming and patterning steps needs to be performed to prepare the fluorescent media for three different <u>colors</u>. Then, a planarizing layer 18 and an insulating layer 19 are successively spun from an insulating material such as polyimide and benzocyclobutene on the fluorescent medium layer 12 to a thickness of approx. 5 m.about.1000 nm and 50 nm.about.200 nm, respectively. The planarizing layer 18 and the insulating layer 19 do not need to be actually two separate layers. Next, predefined regions of the insulting layer 19, the planarizing layer 18 and the fluorescent medium layer 12 are etched out. Either dry or wet etching method may be used. The etched-out regions are then filled with one of the conductive materials selected from either metals such as gold, silver, copper and aluminum, or alloys of them. Any methods of physical vapor deposition, chemical vapor deposition, electroplating, electroless plating, or sol-gel may be used, but electroplating and electroless plating techniques are preferred. The filled parts become the partition walls 13 which serve as auxiliary electrode elements as well as a means to physically separate each of the fluorescent media 12 for the purpose of minimizing the <u>color</u> contamination" (column 3, lines 41-67 to column 4, line 1-2).

Kim further discloses in Figure 2, "the first electrode needs to be electrically conducting as well as light transmitting. Indium tin oxide, most widely used as the first electrode material, is a reasonably good electrical conductor and light transmitter. But its resistivity is still high compared to metals such as aluminum, copper, silver and gold. The poor conductivity results in the voltage drop, which in turn causes the non-uniform luminance over the panel surface. In the present invention, the conductivity of the first electrode stripes has been dramatically improved using an auxiliary electrode scheme: the partition walls 13 are made of a material with an excellent electrical conductivity and are electrically connected to the first electrode elements 14" (column 4, lines 3-14)

Kim further yet discloses in Figure 2, "after the formation of the partition walls 13, the insulating layer is further removed to leave unetched only a small part of the layer 19 as seen in FIG. 2. The remaining insulating layer 19 serves as an electrical insulator between one of the first electrode elements and the adjacent partition wall or auxiliary first electrode. To insure the electrical insulation, the remaining insulating layer has a width preferably greater than 100 nm. The first electrode material is then deposited to fill the etched space. The first electrode material deposited on top of the insulating layer 19 and the partition walls 13 is etched out" (column 4, line 15-25).

However, Kim does not disclose a prism sheet and circularly polarizing and antireflection film. Wortman teaches a prism sheet to direct the direction and the intensity of the light transmitted, however fails to teach a circularly polarizing and antireflection film.

King teaches, "to minimize the reflection of ambient light, an antireflection coating is typically used on the front glass. Also dark backgrounds behind the display are commonly provided. The TFEL laminar stack is situated within an enclosure sealed against the substrate, and the rear wall of this closure is usually blackened to block light from extraneous light sources behind the display, and to absorb ambient light passing through the display from the front. Another method of improving the contrast and attenuating the amount of light reflected from the rear aluminum electrodes is to use an external circularly polarized contrast enhancement filter in front of the display" (column 1, line 28-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed the multi-color ELD array panel of Kim with the prism sheet of Wortman and the polarizing and antireflection film of King in order to direct and control the direction and the intensity of the light transmitted and further improve the resolution and the contrast of the display panel.

6. Claims 11 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,999,153 to Lind in view of U.S. Patent No. 6,019,654 to Kim in further view of U.S. Patent No. 5,771,328 to Wortman.

Regarding to claims 11 and 12, Lind discloses in Figure 4, "a nematic liquid crystal layer 26 is located between alignment layers 29 and addressing electrodes 25 and 27 on opposite sides. The color filter stack 22 and planarizing layer 24 are constructed in accordance with U.S. Pat. No. 5,463,484, wherein the colorants can be those described

above in accordance with the present invention. Two glass panels 21 and 28 enclose the assembly described and linear polarizing filters 30, arranged in mutually perpendicular orientations are attached to the two outside faces of the assembly" (column 4, line 57-65).

Lind also discloses in Figure 4, "a planar white light source 31, which may comprise the illuminating means 16 and which uniformly illuminates the entire display area, completes the display system. It will be understood that FIG. 4 illustrates one possible passive or active matrix display assembly according to the present invention and that other means of illuminating the colored elements with electronically modulated white light are equally within the purview of the present invention. For example, a cathode ray tube (CRT), preferably of the black and white type, may be provided behind the color filter stack 22 and the brightness of various regions of the CRT may be controlled to reproduce the image. Alternatively a particle layer or film layer may be suspended behind the color filter stack 22 and may be backlit. The particle or film layer may include regions of differing light transparency to reproduce the image. Any other means of producing white light intensities with a substantially flat spectral characteristic curve and having regions ranging from dark to bright in regions corresponding to and aligned with the colored display elements may alternatively be used. The intensity levels of the white light source may further be selected to limit the gamut of displayed colors" (column 4, line 66-67 to column 5, line 1-20).

However, Lind does not disclose a separator separating each of the color filter elements and a prism sheet. Kim teaches in Figure 2, "the multi-color ELD array panel includes a plurality of fluorescent media 12 of red, green and blue colors formed on a

transparent support 11, an array of partition walls 13 made of a conductive material between the fluorescent media 12, and first electrode stripes 14 connected to the partition walls 13 and formed over the fluorescent media 12, together with an electroluminescent layer 15, second electrode stripes 16 and a protective layer 17" (column 3, line 30-37).

However, Kim fails to teach a prism sheet. Wortman teaches a prism sheet to direct the direction and controls the intensity of the light transmitted.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed the nematic liquid crystal display of Lind with the partition walls of Kim and the prism sheet of Wortman in order eliminate and prevent color contamination between subpixels and further to direct and control the direction and the intensity of the light transmitted and further improve the resolution and the contrast of the display panel.

Response to Arguments

7. Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art are cited to further show the state of the art of compositon of a image display panel.

U.S. Patent No. 4,678,285 to Ohta.

U.S. Patent No. 4,722,885 to Uehara.

U.S. Patent No. 5,745,197 to Leung.

U.S. Patent No. 5,886,819 to Murata.

U.S. Patent No. 5,909,260 to Ilcisin.

U.S. Patent No. 6,002,460 to Yamamoto.

U.S. Patent No. 6,069,601 to Lind.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.
February 25, 2003

Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800